

**Terms of Reference (TOR)**

For

**Socio-Economic Impact Evaluation Study of  
Bangabandhu Bridge**



Bangladesh Bridge Authority

Bridges Division

Ministry of Road Transport and Bridges

## 1. Background

The mighty river Jamuna physically divides Bangladesh into East and West regions and created a barrier as an impediment to economic development and social unity. In consequence, there was a long national desire to reduce this division by establishing a permanent link between the two regions of the country. In June 1984, the Government of Bangladesh took a decision to construct the Bangabandhu Bridge with Road, Rail, Gas, Electricity Transfer and Tele-communication facilities. The project was approved by the Executive Committee of the National Economic Council (ECNEC) on May 19, 1991. Actual physical work commenced in October, 1994. The 4.8 km long Bangabandhu Bridge with a cost of Tk. 3745.60 cr. (US\$ 936.40 m) was finally constructed in 1998 (World Bank 2000) and opened for operation.

The bridge is now acting as a fixed major link in the national transportation system. With these facilities of communication both by road and rail from North-West to East, movement of traffic have become easier. This, in turn, is expected to result in reducing transport cost and travel time. The farmers of the North-West region are now expected to get fair prices of their crops, which are also expected to encourage commercial farming of various agricultural products. Besides, a good environment has also been created to establish new industries in the North-Western region. Apart from playing a vital role in the transportation system, the bridge is expected to contribute to the economy by facilitating accelerated growth, poverty alleviation and revenue generation.

ADB through Louis Berger Group, Inc. initially examined the impacts of Bangabandhu Bridge on the economy of North-West Bangladesh in 2003. Based on a “before and after” simulation exercise, the report submits that the Bridge imparted positive impacts in that area. Especially, marketing margins of commodities decreased, price integration has increased and more so, the share of traded output increased as a result of decreased transportation costs (The Louis Berger Group, Inc. 2003).

## 2. Introduction

It is now over two decades since the Bridge has been constructed, and it is expected that the full benefits have started to flow not only among the regions that have been connected, but throughout the country. Initial assessment had been done more than 15 years ago (*ibid*). Another partial assessment was done in 2014, to see the employment effect only (Mahmud and Sawada 2014). It is therefore important and timely to have a thorough assessment of impacts created by the construction of Bangabandhu Multi-purpose Bridge to the economy of the North-Western part of the country in general, and



the lives of the poor and the vulnerable people living in that area in particular. This particular impact study is also important from the perspective that the respective authority will need to undertake similar infrastructural development projects in the near future to expedite the economic development of the country further. Hence, Bangladesh Bridge Authority has timely decided to undertake a thorough Socio-Economic impact evaluation study of Bangabandhu Bridge.

Therefore, it is expected that the study will undertake a thorough assessment focusing on the following areas:

- Social;
- Economic;
- Industrialization & Employment Generation
- Ecological and Environmental; and

### **3. Objectives of the Study**

The main objective of the study is to assess the overall socio-economic and ecological impact of Bangabandhu Bridge. The study will try to explore how and to what extent the economy in general, and the people (more specifically the poor people) in particular have benefited due to the construction of the bridge. More specifically, the study intends:

- (i) To assess the social impact, and in particular, to explore whether and to what extent the lives and the livelihoods of the people have been improved;
- (ii) To assess the contribution of the Bridge in poverty reduction in the North-Western part of the country especially in the adjacent districts;
- (iii) To assess whether and what extent the economic activities have been facilitated due to the construction of the Bridge;
- (iv) To assess what extent the Bangabandhu Bridge has contributed to country's industrialization & employment generation; and
- (v) To assess the impact of Ecology and Environment in the North-Western part of the country especially in the adjacent districts.

In addition, this assessment is also expected to provide useful ingredients, analysis and insights for further investments of this kind in future in the country.



### 3. Scope of the Study

In order to achieve the above objectives, the study intends to investigate the following areas by comparing the situation before and after the construction of the bridge. Where applicable, the study will also try to compare the target regions to that of the comparison regions in order to capture the true impact:

- Agricultural production, market integration and prices;
- New enterprises, trade and industry including commodity flows and trade margins;
- Changes in wages and prices including both input and output prices;
- Improvement in employment, in both formal and informal sectors;
- Improvement in health and educational facilities/services and outcome;
- Improvement in transportation and mobility, especially the factor mobility;
- Contribution to poverty reduction and country's GDP;
- Improvement in industrialization & employment generation; and
- Ecological and environmental impact of the Bridge.

In addition, the study would also like to attempt the following:

- Comparing the overall impact against what was mentioned in the Feasibility study done in 1989;
- Undertaking the financial analysis considering all income and expenditure from the Bridge including DSL payment and comparing them with that of the Feasibility study;

### 4. Analytical Framework and Evaluation Design

#### A) *The analytical framework:*

The analytical framework that the study will follow is presented in the following flow-chart:



- *Relevance*: The extent to which the objectives of constructing the bridge are consistent with the requirements of the beneficiaries (i.e., who are benefited from it) and needs of the region as well as the country.
- *Effectiveness*: The extent to which the objectives were achieved, or are expected to be achieved, taking into account their relative importance.
- *Efficiency*: A measure of how economically resources/inputs (funds, expertise, time, etc.) are converted into results.
- *Impact*: Positive and negative primary and secondary long-term effects produced by the construction of the bridge, whether directly or indirectly, intended or unintended.
- *Sustainability*: The continuation of benefits from the bridge years after the completion of the construction. It must be both environmentally and financially sustainable. Sustainability can be defined here as the ability of key stakeholders to sustain intervention benefits with efforts that use locally available resources.

### ***B) Evaluation Model/Design***

There are several models through which the impact evaluation can be performed. The most important models include:

- (1) **Experimental Design – The Randomized Controlled Trials (RCTs)**: Sometimes these are also called randomized experiments or randomized evaluations. The approach involves random assignment of who or where gets the treatment. This means that groups that are in the intervention group and those that are in the control group are chosen at random from a list of groups eligible for the program. This is not the same as taking random samples of those already in the treatment and non-treatment groups. This method can only be applicable if the evaluation process starts before the implementation of the project.
- (2) **Quasi-experimental Design with Before and After Comparisons of Project and Comparison Populations**: The design employs statistical methods to establish a comparison group, which has the similar characteristics as the beneficiary group, apart from the intervention. The main quasi-experimental approaches are double difference or difference-in-differences, propensity score matching, and regression discontinuity design. All these approaches seek to establish a comparison group that is as similar to the beneficiary groups as possible. Impact is then calculated as either the difference in outcomes after the intervention (ex-post single difference), or the difference in the differences in outcomes between baseline and end line (DiD). To improve control of selection bias, differencing may be combined with



some form of matching. These approaches have been the most common in impact evaluation.

- (3) **Regression-based Approach:** This approach does not establish an explicit comparison group, though the data have to include observations on untreated or less treated units. These estimate regression models in which participation is usually captured through a dummy variable. These approaches include endogenous treatment models, instrumental variables, switching regressions, and double robust regression.
- (4) **Qualitative Methods:** These help to understand the nature and the processes through which the changes/improvements have occurred. These methods can also be used as complementary to the quantitative methods described above. In fact, the integration of quantitative and qualitative methods, which is now popularly known as the q-squared approach, has gained popularity in research and evaluation in recent years. Qualitative methods include: resource mapping, participatory rapid appraisal (PRA), focus group discussion (FGD), key informant interview (KII), case studies, etc.

Based on the above, the proposed evaluation would like to apply: (i) the Quasi-Experimental Design; (ii) the Regression-based Approach; and (iii) the Qualitative Method.

## **6. Methodological Approach and Data**

As already mentioned, the study will adopt the q-squared approach, which means the study will use a combination of both the quantitative and the qualitative research methods.

### ***Baseline Data and the Comparison Group***

Important issue here is to find the proper baseline data and appropriate comparison group in order to apply the quasi-experimental methods. The study team will explore with the relevant agencies/organizations involved in the implementation and/or evaluation done earlier in order to obtain the baseline data, if available, in any form. In the absence of any credible baseline data, and even in addition, the study will also use survey data available from various secondary sources for the period just before the construction of the Bangabandhu Bridge as baseline. One of the important sources in this respect is the surveys carried out periodically by the Bangladesh Bureau of Statistics (BBS). For example, the Household Income and Expenditure Surveys (HIESs) of BBS that are being



carried out one in every few years-time, and this will provide the study team an opportunity to use the HIES data for the pre-bridge period as baseline in this respect. Similarly, the economic census, the labor force surveys, etc., will also be used for the same purpose. The advantage of these surveys is that these are administered country-wide, and hence the study team will be able to use the same data sets for the comparison group as well.

For any meaningful impact evaluation, having a credible counter-factual is vital. The Bangabandhu Bridge connected the North-West region with the Eastern part of the country, and hence the entire North-Western region and the people living in that part of the country are the direct beneficiary of the bridge. And, at the same time, the South-West region of the country is still disconnected (and that is why the construction of Padma Bridge is so important) from the Eastern part. While there are some differences between the North-West and the South-West, there are many commonalities (distance from the capital, remoteness, adverse geography, vulnerability to natural hazards, poverty, etc.) between the two regions as well. Hence, the study considers the South-West region and the people living in that part of the country as the comparison region/group.

### *Undertaking the Primary Surveys*

Once the issues of baseline data and the comparison groups are resolved, is it then a matter of undertaking new surveys before using the quasi-experimental method for the evaluation. The study team therefore proposes to undertake primary surveys among both the beneficiary and the comparison regions/groups. For the new surveys, the study may do the following:

- Household survey of a representative panel of households drawn from both the beneficiary and the comparison region/group;
- Resource/enterprise mapping across the North-Western part of the country to map out the economic and social organizations developed as a consequences of the construction of Bangabandhu Bridge including gas and electricity supply through bridge;
- Enterprise survey of a representative sample including Export Processing Zones (EPZs) and Special Economic Zones (SEZs) and
- Market surveys of a representative sample as well.

In addition to the quantitative surveys, the study would also like to undertake a thorough qualitative investigation in order to understand the nature, processes and how it has



impacted upon the lives of the people living in that part of the country. The qualitative investigation would include the following:

- Participatory Rapid Appraisal (PRA);
- Focus Group Discussion (FGD);
- Key Informants Interviews (KIIs);
- Local Level Consultations; and
- Selected Case Studies.

Thus, the methodological approaches that the study will consider include the following:

- Review of relevant literature and project related reports and documents;
- Performing the descriptive analysis of quantitative data;
- Analysis of quantitative data using the quasi-experimental method, especially the difference-in-difference method;
- Analysis of quantitative data using the regression-based methods (Logit, Probit, etc.) as well;
- Undertaking the ‘discourse’ and ‘content analysis’ of the qualitative data collected through qualitative methods to be used; and
- Finally, carrying out Case Studies of some selected enterprises and households to illustrate the impact cases of Bangabandhu Bridge.

For most part of quantitative analysis, the study may use the statistical software such as STATA, SPSS, E-views etc.

### ***Data Sources***

In order to do the above, the study intends to carry out the following surveys and case studies:

- As already mentioned, the study would like to survey a representative panel of households drawn from the North-Western and the South-Western parts of the country (i.e., from Rajshahi, Rangpur and Khulna divisions). This enables the team to make a comparison between the regions with connectivity (through the afore mentioned bridge) and the regions without (i.e., the South-Western Part of the country).
- The study would also like to undertake a resource mapping across the North-Western part of the country that is expected to be the direct beneficiary of the bridge. This will be done initially during the inception/scoping phase, and then substantially during the main data collection phase through physically visiting and





interviewing people from different important locations (e.g., district head-quarters, market places, and growth centers).

- The study would also like to undertake qualitative investigation including, among others, interviews with key stakeholders and informants, as well as interviews with policy makers.
- Some selected Case Studies on enterprises and households will also be undertaken to document the processes of improvements that might have happened due to the construction of the bridge.
- In addition, the study would also like to use the following nationally representative survey data to be obtained from secondary sources:
  - ✓ Household Income and Expenditure Survey (HIES) data of BBS of several rounds (from 1990-91 till 2016);
  - ✓ Economic Census data of BBS from 1990-91 till 2013;
  - ✓ Census of Manufacturing Industries (CMI/SMI) from 1995-96 till 2012; and
  - ✓ Labor Force Survey (LFS) from 1995-96 till 2016-17.
- Besides, data on financial and maintenance aspects of the bridge and also on user information will be collected from the bridge authority to undertake the financial analysis.
- In addition, the study would also carry-out an assessment of the impact on the ecology of the catchment area.
- Finally, the study will also look into the institutional aspect, i.e., improvements in institutional capacities of the agencies involved in the processes.

*The study design, methods and the instruments along with the sample size and the sample locations shall be detailed out in the inception report.*

## **7. The Deliverables**

The study is expected to deliver the following deliverables:

- i) The inception report outlining the study design and the methods to be used in details including sample size, selection of sample locations, units and households, and also the instruments and strategies for data collection. The study team may visit the study areas and carry out the scoping for the study before preparing and submitting the inception report (10 copies).
- ii) Presentation of inception report in the inception workshop in order to have an early feedback on the overall design of the study.



- iii) Preparing the draft evaluation report summarizing the findings of the study based on the objectives and scope of the study outlined above and submitting the report to the Bangladesh Bridge Authority (10 copies).
- iv) Presentation of the draft report in the workshop in order to receive comments on the draft report;
- v) Revising the report based on the comments received and submitting the revised report (10 copies).
- vi) Finalizing the report based on further comments, if any, and submitting the final report (10 copies).
- vii) Finally, disseminating the final evaluation report through organizing the final dissemination workshop (50 copies of the executive summary of the final report for the workshop participants).

## 8. Timeframe and Activity Sequencing

Sl. No.	Activities	months					
		1	2	3	4	5	6
1.	Team mobilization, preparatory work and review of literature including project related documents and reports.						
2.	Initial field visits, scoping, detailing out of methods including sampling and survey instruments.						
3.	Preparing the <b>inception report</b> .						
4.	Presenting the report in the inception workshop.						
5.	Recruitment of field investigators, training and pre-testing.						
6.	Undertaking the primary surveys across adjacent districts including qualitative investigation.						
7.	Collection and compilation of secondary data.						
8.	Data entry and cleaning of primary surveys.						
9.	<i>Analysis of survey data – both quantitative and qualitative including case studies.</i>						
10.	Preparing the <b>draft report (first draft)</b> .						
11.	Presenting the report in the workshop						

12.	<b>Revising the report</b> based on the comments received						
13.	<b>Finalizing the report</b> based on further comments, if any						
14.	Presenting the final report in the final dissemination workshop						

### 9. The Study Team (core team)

Sl. No.	Heads of Expenditure	Qualification	Experience	Person-months Involvement
1	Team Leader/Study Director	Educational Experience: PhD in discipline of Social Sciences such as Economics/Sociology/Social work/Public Administration from any reputed University (abroad will be preferred).	General Experience : Minimum 15 years  Experience in the relevant field: Minimum 10 years	
2	Poverty Specialist	Educational Experience: PhD in Economics/related discipline from any reputed University (abroad will be preferred).	General Experience : Minimum 10 years  Experience in the relevant field: Minimum 5 years	
3	Environmental Specialist	Educational Experience: PhD in Environmental Economics/Environmental Science from any reputed University.	General Experience : Minimum 10 years  Experience in the relevant field: Minimum 05 years	
4	Socio-economist/ Sociologist	Educational Experience: PhD in Social Science/ Sociology from any reputed University.	General Experience : Minimum 08 years  Experience in the relevant field: Minimum 05 years	
5	Statistician/ Econometrician	Educational Experience: PhD in Economics/Applied Economics /Applied Econometrics/ Statistics from any reputed University.	General Experience : Minimum 05 years  Experience in the relevant field: Minimum 03 years	




6	Junior Researcher/ Research Associate	Educational Master's in Development Statistics/ Work/ Development Studies from any reputed University.	Experience: Economics/ Economics/ Sociology/ Anthropology/ Social Development Studies from any reputed University.	General Experience : Minimum 04 years Experience in the relevant field: Minimum 02 years	
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In addition, the study team is also expected to recruit other project staff including Research Officers (ROs) and Field Investigators (FIs) for undertaking the surveys.

References:

01. *Mahmud, M. and Sawada, Y. (2014): "Infrastructure and Well-being: Employment effects of Jamuna Bridge in Bangladesh (C-31106-BGD-1)", IGC Working Paper, December 2014.*
02. *The Louis Berger Group, Inc. (2003): "Jamuna Bridge Impact Study", Final Report, prepared for Asian Development Bank, February 2003.*
03. *World Bank (2000): "Implementation Completion Report.... for the Jamuna Bridge Project", The World Bank, 2000.*

  
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